National Institute of Environmental Health Sciences

Impact of the South-to-North Water Diversion Project on the transmission of Schistosoma japonicum in China

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Abstract:

The South-to-North Water Diversion Project (SNWDP) is currently the key, national, water-conservation project in China, designed to optimise the use of water resources and relieve the water shortages in the north of the country. As one of the main water intakes for the project, that of the Eastern Route Scheme (ERS), is a breeding site for Oncomelania hupensis (the intermediate host of Schistosoma japonicum), there is concern that the snail may be carried far to the north, in the water passing through the project. To see if they could survive and breed to the north of their current range in China, O. hupensis were collected in marshland near Nanjing City and transferred to cages, on the banks of fish ponds, in the cities of Zhenjiang (in Jiangsu province, at 32 degrees 10'N), Xuzhou (in the same province but at a latitude of 34 degrees 23'N) and Jining (in Shandong province, at 35 degrees 23'N). Except over the first 6 months in Xuzhou, the snails moved north of their natural distribution did not survive and reproduce as well as those in Zhenjiang, and all those transferred to Jining died out within 1 year. Although the snail populations in Xuzhou survived for 7-8 years and retained their infectivity to S. japonicum, histological and histochemical studies revealed abnormalities in the reproductive organs of these snails. It is concluded that, unless global warming significantly increases the minimum winter temperatures in northern China, the SNWDP is unlikely to result in the northward spread of schistosomiasis japonica.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes

Geographic Feature:

resource focuses on specific type of geography

Freshwater

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: China

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Schistosomiasis

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content